Modeling the Effect of Age in Sports Performance

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In 2012 Robert Lida became the first man over the age of 75 to run 100 meter in under 13.50 seconds. By comparison, the women’s 95+ record is 35.48 sec set in 2010 by Katsuko Iwaki of Japan. How fast will a 100-year-old woman run the 100m in 20 years? The past fifty years have witnessed an incredible improvement in the sport performances of “masters” athletes – those over 35 years old. Men and women as old as 104 have been pushing the envelope of what's possible for their age group every year in running and swimming events. Using 175,000 records from the US masters swimming organization and a large running data base, I will model the average deterioration in performance that one can expect from age 35 to 100 in various events and distances in both running and swimming. I will use JMP to build several competing models and look at comparisons of the models and various model averages in an attempt to tease out the "age" effect.

We will then use the model to predict age and sex handicaps for the Dipsea. The Dipsea race is a 100-year-old event that starts in Mill Valley CA and ends 8 miles later at the Pacific Ocean near Stinson Beach. What makes the event unique is its handicap system. Each age group for men and women receive a handicap time. For example, the slowest group, the AAA group, comprised of men 74 years old and older, boys 6 and under, women 66 and older, and girls 7 and under, receive a 25 minute handicap. But what makes the event unique is that each group starts ahead of the scratch group by that amount. So first to leave, at 8:30 AM, is the AAA group. Finally 25 minutes later, the 19-30 year old men get to go. The winner is the one who crosses the finish line first. Using our model we will compare our handicap to the Dipsea and see which one gives the fairer age and sex handicap.

Richard De Veaux, Ph.D. (Dick) is C. Carlise and Margaret Tippit Professor of Statistics at Williams College. He holds degrees in Civil Engineering (B.S.E. Princeton), Mathematics (A.B. Princeton), Dance Education (M.A. Stanford) and Statistics (Ph.D., Stanford), where he studied with Persi Diaconis.

Before Williams, Dick taught at the Wharton School and the Engineering School at Princeton. He has also been a visiting research professor in France. De Veaux has won numerous teaching awards including a “Lifetime Award for Dedication and Excellence in Teaching” from the Engineering Council at Princeton. He has won both the Wilcoxon and Shewell (twice) awards from the American Society for Quality, is a fellow of the ASA and an elected member of the International Statistical Society. In 2006-2007 he was the William R. Kenan Jr. Visiting Professor for Distinguished Teaching at Princeton University. In 2008 he was named the Mosteller Statistician of the Year by the Boston Chapter of the American Statistical Association. He currently serves on the Board of Directors of the American Statistical Association and is the Chair-Elect of the Section on Statistical Learning and Data Mining.

Dick has been a consultant for nearly 30 years for such Fortune 500 companies as Hewlett-Packard, Alcoa, American Express, Bank One, GlaxoSmithKline, Dupont, Pillsbury, Rohm and Haas, Ernst and Young, SanofiPasteur and General Electric. He holds two U.S. patents and is the author of more than 30 refereed journal articles. He is the co-author, with Paul Velleman and David Bock, of the critically acclaimed textbooks “Intro Stats”, “Stats: Modeling the World” and “Stats: Data and Models” and with Norean Sharpe and Paul Velleman of “Business Statistics”, and “Business Statistics: A First Course”, all published by Pearson.

His hobbies include cycling, swimming, singing (barbershop, doo wop and classical) -- and dancing (he was once a professional dancer and taught Modern Dance during Winter Study at Williams). He now teaches a course called “The history, geography and economics of the wines of France”. He is the father of four: two boys and two girls ages 25, 23, 21 and 19.